Workshop Summary:

Workshop on Marine Plant Aquaculture: Challenges and Opportunities

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OPENING COMMENTS

Tla-o-qui-aht First Nation

Representatives of the Tla-oqi-aht First Nation began by welcoming the participants and expressing the significant interest coastal First Nations have in marine plant aquaculture. They noted that First Nation communities have learned much from the Shellfish Development Initiative and that this knowledge could be applied to marine plant aquaculture.

Al Martin: BC Fisheries

Al Martin, Director of the Sustainable Economic Development Branch at BC Fisheries provided the opening address welcoming all participants and thanking Fisheries Renewal BC for their support of the workshop. He acknowledged that the province's goal of a developed and diversified aquaculture industry has so far concentrated on finfish and shellfish and that opportunities around marine plant aquaculture merit a closer examination. He emphasized that marine plant aquaculture has the potential to become an environmentally friendly, sustainable industry that provides needed year-round employment for coastal communities.

Al Martin explained that the main purpose of the workshop was to identify the degree of interest in marine plant aquaculture on the west coast of Vancouver Island and that the major goals of the workshop were to:

- Provide a venue for industry, government, First Nations and stakeholders to discuss ways BC Fisheries can play a positive role in fostering a successful marine plant industry
- Identify existing economic, biological and social concerns around marine plant aquaculture; and
- Explore the possibilities and limitations of marine plant aquaculture in BC.

He also noted that a successful workshop would result in a clearly defined approach to developing the marine plant industry and illustrate the type of regulatory framework that would most benefit this fledgling industry. The participants were asked to consider the workshop as an opportunity to provide input to the province as well the Department of Fisheries and Oceans on how they wish to pursue marine plant aquaculture.

In conclusion, he stated that due to the relatively untried nature of marine plant aquaculture in BC, a viable marine plant cultivation industry would require considerable effort in terms of supporting policy and investment from the public and private sectors.

THE HISTORY OF MARINE PLANT AQUACULTURE IN BC

Michael Coon: Director Land Use Coordination Office

Michael Coon, currently the Director of the Land Use Coordination Office and previously the Ministry of Agriculture, Food and Fisheries' marine plant biologist from 1973 to 2000, presented an overview of the history of marine plant industry in BC. He described an industry that has been fraught with many of the same problems again and again since its beginnings in 1949. From his unique position as marine plant biologist for the provincial government he watched and learned from the mistakes made by past marine plant ventures. He cited six main factors as contributors to the failure of earlier marine plant companies and why the marine plant industry has had limited success in BC to date. These were:

- remoteness from infrastructure and markets;
- limited 'risk' capital for the research and development and start up costs needed for a new industry;
- cultural factors ie. North American cultures have much less affinity for marine plant products in comparison to Asian cultures;
- lack of key knowledge: inaccurate or poor stock assessments, poor processing knowledge, minimal market information;
- failure to engage First Nations in meaningful ways from the beginning; and
- competition from low cost, well established producers.

Michael Coon also offered advice on what can be done to achieve a more successful industry in the future. He advocated maximizing the 'BC advantage' which includes utilizing the large amount of knowledge that has built up in BC over the last 30 years on marine plant aquaculture, the relative political stability in BC, the proximity of markets and the large diversity of marine plants that grow in BC. He also suggested that attention be focused on problems that have been shown to exist historically such as regulatory uncertainty, in order to improve the 'system'.

Michael Coon observed that historically, one aspect of successful marine plant businesses has stood out: their small scale. As has been recommended on the East Coast and Europe as well as several times here in BC, Michael Coon supported the idea of concentrating efforts on niche markets. He noted the importance of being market driven and concentrating on meeting and beating competitor's quality and price. He added that technology should be used when possible to minimize costs throughout product chain in order to compete with low cost producers.

Michael Coon concluded by highlighting the importance of forming strategic alliances among producers, processors, marketers, buyers and governments (including First Nations) from the start to maximize knowledge and minimize risks.

A GLOBAL

Satara Malloch, an Aquaculture Development Assistant with BC Fisheries'

PERSPECTIVE ON MARINE PLANT AQUACULTURE: OPPORTUNITIES AND CHALLENGES

Sustainable Economic Development Branch presented a broad overview of the global marine plant aquaculture industry. She began by informing the audience about two helpful documents on marine plant opportunities: 1) the 1995 Seaweed Market Study by Ferrence, Weicker & Co. and 2) a recent report by Satara Malloch titled Marine Plant Management and Opportunities in British Columbia. Both of these documents are available from BC Fisheries.

Satara Malloch: BC Fisheries

Satara Malloch presented market data from the Food and Agriculture Organization of the United Nations that illustrated the high value of seaweeds cultivated for food products compared to those cultivated for industrial uses. She noted that an exception to this general trend is the high price obtained for seaweed products used in biotechnology applications.

In outlining the market opportunities in BC, Satara discussed the market size, suitable products and the species of marine plants that could be utilized in making these products. She also noted the significant potential of niche markets including markets for cosmetics, pharmaceuticals, nutracueticals, health spas, abalone/urchin feed, value-add food products and fertilizers.

After briefly describing some challenges to marine plant aquaculture, (cost competitiveness with imports, finding financial backing for untried seaweed businesses and food preferences of consumers) Satara Malloch concluded by highlighting several factors that give BC an advantage in marine plant aquaculture. She noted that a large amount of effort that has already gone into developing techniques for culturing several west coast species of marine plants. Satara added that because seaweeds are often consumed for health reasons, BC could have a distinct advantage over more polluted areas of production as it is likely that for the immediate future these areas will become more rather than less polluted. This means that the clean coastal waters of BC could become a valuable selling feature.

CASE STUDIES OF SUCCESSFUL MARINE PLANT AQUACULTURE BUSINESS AND OTHER OPPORTUNITIES FOR SUCCESSFUL VENTURES

Louis Druehl: Canadian Kelp Resources Ltd.

Dr. Louis Druehl is a professor at Simon Fraser University and has spent over 30 years studying kelp, he also operates Canadian Kelp Resources with his wife Rae Hopkins. They have been selling dried kelp to the health food market as well as providing raw material for pharmaceutical production since 1982.

Dr. Druehl began his presentation by pointing that BC has the greatest diversity of kelps in the world (22 species) and that the technology to culture six of those species (*Laminaria groenlandica, Laminaria saccharina, Cymathere triplacata, Macrocystis integrifolia, Nerocystis leutkeana, and Alaria marginata*) have been developed in BC. He went on to discuss various products that his company is currently producing including sea vegetables, pharmaceutical raw material and raw material for cosmetics.

Dr. Druehl explained that kelp farming consists of two stages, seed production and long-line cultivation and that it is possible to produce up to 40 wet tonnes of kelp per acre per year. He described the operational aspects of running a kelp farm and illustrated his talk with pictures of existing farms. He noted the importance of seeding strategies and logistical considerations such as the density of plants on longlines and how this could influence the ability to harvest the crop. He emphasized the importance of harvesting with care as the quality of the product is critical to its market value.

Dr. Druehl concluded by discussing the projects and opportunities that he saw for the culture of marine plants. He noted that he and his wife had no difficulties selling all

the kelp they grew at their farm. He suggested that there were opportunities in the sea vegetable market, including herring-roe-on-kelp, as well as the market for plant fertilizers, pharmaceuticals, cosmetics, and feed for rearing sea urchins and abalone.

Ed Cayer: Ocean Produce International

Ed Cayer is the Vice-President of Ocean Produce International a company that specializes in 'mariponics', the land-based cultivation of seaweed and sea vegetables as these edible seaweeds are often called. His presentation outlined how his business graduated from a 'retirement project' to a successful company selling sea vegetables to the gourmet food market and chemical compounds to the biotechnology industry.

Ed Cayer said he was looking for a unique, high-end, value-added product when he decided to go into business for himself and believed that a tasty mutant strain of *Palmaria palmata* discovered by the National Research Council and not known to exist in the wild, fit the bill. Today he grows two mutant strains of *P. palmata* called 'Nova Scotia Sea Parsley' and O-Pika-1 in a 30 X 90 meter greenhouse that is supplied by a saltwater well.

He noted that an important component of his success can attributed to the land-based system he uses to produce his products. He explained that by raising his crop in a controlled environment he has been able to increase the rate of production substantially and have some degree of control over the characteristics of the product. He also expressed his desire to run the greenhouse facility as efficiently as possible, this included saving energy by drying his product on shelves in the greenhouse.

Ed emphasized that he marketed his products aggressively and in innovative ways - for instance over the internet and by contacting potential users of his products directly. He discussed the possibility of using eco-tourism as a marketing method and how selling Sea Parsley in a locally made silk-screened poplar box turned into an effective method of advertisement.

Ed concluded by acknowledging that he is now moving away from the sea vegetable market and concentrating on the more lucrative fine chemical market. Through bio-chemical analysis he discovered that O-Pika-1 contained a high concentration of kanic acid, a compound used in neurological research.

How Do You Identify Aquaculture Sites

Barron Carswell: BC Fisheries

Barron Carswell, the Shellfish Aquaculture Development Officer from BC Fisheries was asked to speak about site selection for marine plant aquaculture. He observed that site selection could be broken down into three components:

1. biophysical capability in relation to the species and culture technique,
2. suitability of activity in context of other uses and
3. the logistics of the site.

Barron explained that although few capability studies for marine plants have been done, it is possible to proceed using alternative information sources including: surrogate data sets (herbarium collections, BC Fisheries' annotated bibliography of marine plant surveys); educated guesses based on requirements for both the species and culture system; and experience gained through pilot scale culture. It was suggested later in the workshop that knowledgeable locals are also an excellent information source.

Macrocystis integrifolia and *Porphyra* are two of the few species of marine plants for which culture requirements are relatively well known. Barron briefly summarized these and provided a rational of why the biophysical criteria for the Japanese Scallop or the Pacific Oyster could be used as surrogate data sets for determining possible locations for kelp culture.

The proposal's compatibility with other uses is also of high importance to site selection. Barron noted that suitability mapping has been completed for most of the west coast of the Vancouver Island as part of the Shellfish Development Initiative. He illustrated this with a map showing how Barkley Sound has been divided into unsuitable, potentially suitable and suitable areas. As shellfish aquaculture includes marine plants under the Land Act, the resulting maps can be used to assess sites for suitability for marine plant culture.

Barron concluded by emphasizing that site selection is critical to the success of a marine plant aquaculture operation. He noted that although no formal capability-studies have been completed, there are many sources of information that should be consulted as a starting point for site selection.

The Regulatory Approval Process: What Is It And How Should It Evolve

Jim Russell: BC Assets and Lands

After introducing himself, Jim Russell of BCAL's Aquaculture Operations, began by explaining how the Shellfish Development Initiative announced in 1998 by the Ministers of Fisheries and Environment, Lands and Parks related to marine plant aquaculture. He stated that as marine plants are classified as shellfish under the Land Act, they were implicitly included in any shellfish initiative. He noted that BCAL houses the government's joint BC Fish/BCAL shellfish unit and functions as the one-window office for shellfish and marine plant aquaculture licence and tenure approvals.

Jim emphasized that the main objective of the Shellfish Development Initiative was to realize the potential of shellfish and marine plant aquaculture for coastal communities and First Nations. He added that BCAL and BC Fisheries were working on streamlining and improving the administrative processes for issuance of tenure and shellfish and marine plant licences.

As part of the Shellfish Development Initiative the government is committed to increasing the amount of land held under shellfish/marine plant tenures. Jim noted that

objectives of the Shellfish Development Initiative include increasing the utilization of existing tenures and doubling the land held under tenure over ten year period.

Jim assured the audience that this development will not come without considerable community consultation. He described how the government, as a major component of the Shellfish Development Initiative, has been working with coastal communities to determine how and where industry develops. Jim added that Community Steering Committees have been formed and that one of their functions is to produce maps indicating where development is suitable. He mentioned that Barron had shown examples of some the completed community maps and that these maps are available from BCAL.

In addition to producing maps, the steering committee will develop criteria to review applications to ensure that communities benefit from development in their area. Jim added that they will also provide advice to government on appropriate rate of development for their areas.

Al Martin:
BC Fisheries

Al Martin began by acknowledging how important a clear regulatory regime is for the successful development of any industry, be it shellfish or marine plants. He noted that a major challenge from a regulatory perspective includes the fact that marine plant aquaculture is a comparatively minor enterprise in British Columbia and therefore the regulatory regime is relatively undeveloped. He added that as Jim Russell's presentation indicated, the regulatory framework developed for shellfish could be applied as far as it was useful, to marine plants.

Al explained that the planning and consultation aspects of the regulatory approval process for shellfish and marine plant aquaculture tenures and licences have been addressed with the goal of increasing stakeholder's confidence in the regulatory system. He noted that as a result of shellfish aquaculture development there is now greater inter-governmental cooperation and coordination between provincial and federal agencies. He added that timelines have to be set for application review and approval in order to increase a proponent's ability to plan ahead.

Al concluded by suggesting that the current framework could be modified to allow for experimental marine plant aquaculture that would provide valuable information regarding siting, production levels and environmental concerns.

Programs Available to Assist the Aquaculture Industry

Carolyn Hole : Ministry of Community Development, Co-operatives and Volunteers

Carolyn Hole, an Evaluation Analyst with the Ministry of Community Development, Co-operatives and Volunteers (now the Ministry of Community, Women and Aboriginal Affairs) introduced herself and her Ministry, which she described as a new ministry concerned with economic diversification at the community level. She presented an overview of MCDCV funding programs that may be available for marine plant aquaculture projects. She noted that the Ministry offers funding through the following branches: Urban and Community Development, Community Transition and Planning, Cooperatives, Volunteers and Community Enterprise Development.

Carolyn Hole's presentation focused on two funding programs offered by the Community Enterprise Development Branch which she believed were best suited to marine plant aquaculture projects. One of the programs: Community Business Development, is available to community organizations for projects that have broad-based community support. This program provides funding that matches the contributions made by the community organization (50-50 cost shared) for activities such as opportunity identification, analysis and planning and project implementation.

The second program she discussed was Community Capacity Building, a program designed to create sustainable social and economic livelihoods for marginalized people. To be eligible for this program, the community group must demonstrate support from at least one other community-based organization. She gave the web address (http://www.gov.bc.ca/cdcv/) for those that would like to obtain more information on these programs. She also noted that Wendy Klyne is the regional contact for the MCDCV in this area.

In concluding, Carolyn noted that MCDCV has funded marine related ventures in the past such as shellfish projects that included business planning, marketing, feasibility studies and shellfish surveys.

If You Grow It - How Can You Sell It?

Ed Cayer: Ocean Produce International

Ed Cayer began his presentation on marketing marine plants by highlighting the importance of markets and marketing to the success of any business. He stated that markets and marketing are at least as important to any marine plant business as growing the product.

Marine plants are a tough sell to food retailers who see 276 new vegetables introduced every year, so Ed recommended targeting the consumer directly, for instance at farmer's markets, on the internet or even approaching restaurants and chefs in person. He also suggested that marketing effort be concentrated in geographical areas that are more likely to purchase fresh seafood products or are open to unique products such as large metropolitan centers. He noted that in addition or perhaps as an alternative to selling marine plants through retailers it may be more beneficial to build a relationship with the manufacturing sector.

Over the last five years, the functional food market has shown substantial growth as consumers continue to show increased interest in healthy living and healthy diets. Ed saw great potential in this market for marine plant products, specifically in three areas:

- consumers seeking specific nutrients;
- consumers looking to improve their diet; and
- consumers seeking trendy food.

Ed advocated using the Japanese certification system for certifying a marine plant product as a functional food. In Japan, 'functional food' or 'fochu' certification is possible if a product contains one of 42 certified ingredients in sufficient quantities. He added that an excellent way to get into this market is to license a producer to use a recipe that you have developed and then provide the raw material for the product.

The nutraceutical market is also expanding due to consumer fixation with products that assert health benefits. Ed noted that aging baby boomers will ensure that this market continues to grow. As marine plants have been shown to have some unique and beneficial compounds and as Ed has found, some of those compounds are more accessible or in larger quantities than in land plants, marine plants are a suitable raw material for nutraceutical production. For these reasons, Ed also emphasized the potential of the chemical, pharmaceutical and fine chemical market. He noted that there are many applications for chemicals found in marine plants, from medical research and pharmaceuticals to fertilizer components and functional foods.

In closing, Ed stressed the significance of proprietary materials both as effective marketing tools and as valuable company assets. He noted that trademarks are important for product branding which has been shown to greatly influence consumers' buying habits. He added that trademarks, patents and exclusive products make a company more attractive to investors as these are considered company property.

THE BUSINESS PLAN

Bill Heath: Shellfish Production Specialist Ministry of Agriculture Food and Fisheries

Bill Health, BC Fisheries Shellfish Production Specialist was asked to create a presentation that covered the basics of business plans. He began by pointing out the strong connection between creating a business plan and a company's success, leaving no doubts in the audience as to the importance of having a plan. He mentioned that he had created a template for a shellfish business plan and that this plan will be available shortly on the Ministry of Agriculture, Food and Fisheries website. He noted that the he and Chris Neufeld are in the process of creating similar tools for marine plant business planning that will be available by the end of the summer for interested participants.

A complete business plan covers every part of a business including goals, marketing, labour requirements, production plan and finances. Bill explained that actually writing a plan will compel careful examination of every aspect of a business as well as aid in communicating a company's goals to potential

investors or financial institutions. He presented a brief overview of the components of a business plan and discussed how various aspects of marine plant culture would fit into this plan.

An effective business plan is an on-going and iterative process and as Bill emphasized, needs time and effort to be done effectively. He added that a well-prepared business plan makes the tenure application process a far easier undertaking. He concluded by stating that a business plan should be considered a living plan and that it must be revisited and revised regularly to ensure that it continues to aid a company in reaching it goals.

CLOSING COMMENTS

Ed Cayer: Ocean Produce International

Ed Cayer summed up some of the pros and cons of land-based marine plant aquaculture as compared to ocean-based production as follows:

PROS	CONS
▪ ability to control the environmental conditions and manipulate the chemical constituents of the product	▪ greenhouse facility may be limited by amount of sunshine
▪ control of water temperature	▪ high cost of land in BC
▪ inexpensive hydro in BC	
▪ control of water quality through salt water well	

He also provided some comments on the knowledge gaps in marine plant aquaculture and suggested several ways to improve the existing knowledge base. He noted the value of a mentoring program, a resource library and/or a resource website for an industry that does not have many information resources. He added that the kelp condominium idea discussed in the Biology and Technology of Marine Plant Aquaculture Group Session would also provide valuable information.

Ed recommended contacting the Ministry of Small Business, Tourism and Culture and the Canada Small Business Center for additional information on resources. He mentioned that in starting his company he received funding from the Federal Government's Industrial Research Assistance Program (IRAP).

Ed noted that the most significant area of concern to participants at the workshop was their ability to market and sell their product. He suggested that marketing is not static and a successful business will continue to examine potential markets as long as it is in operation. He added that creating a market identity is critical and an extremely useful tool for doing so is product branding.

In closing, Ed stressed that entrepreneurial spirit and competitive drive are essential to starting a business in a novel area such as marine plant aquaculture. He believes there is an incredible opportunity for marine plant aquaculture in BC, but that it depends on

good information sources and more importantly, entrepreneurial spirit.

John Kafka: Cornerstone Planning Group

John Kafka, the workshop facilitator and a partner of Cornerstone Planning Group provided closing comments for the workshop. First, he thanked the Tla-oqi-aht First Nation for hosting the workshop on their traditional lands and acknowledged Fisheries Renewal B.C. for providing partial funding for the event. He also thanked the industry representatives, Louis Druehl and Ed Cayer for sharing their ideas.

John indicated that the key conclusions of the workshop as identified by the participants included the need to:

1. Identify markets that could support the development of a marine plant aquaculture industry.

2. Identify the best way of growing the species that have market demand.

3. Ensure that there is a clear and streamlined regulatory approval process.

4. Ensure that financial resources are available to assist those who wish to begin developing this new industry.

John reiterated Ed Cayer's sentiments that the development of a successful new industry and markets is based largely on entrepreneurial skills and creativity. He added that the attendance at the workshop and the comments from the participants testify that there is an interest from the community and the province in pursuing further development of the industry. The challenge will be for individuals, the community and government to work together to take the steps which will facilitate opportunities.

John noted that the workshop had successfully identified some critical ideas, next steps and resources that are available for those seeking to further pursue marine plant aquaculture. These include:

- BC Fisheries' Barron Carswell is prepared to provide individuals with existing maps that provide an indication of possible sites for marine plant aquaculture.

- B.C. Fisheries' Bill Heath is preparing a business plan template that can assist individuals in preparing their business plans;

- B.C. Fisheries Satara Malloch is prepared to provide interested individuals with copies of past marine plant market studies conducted by or on behalf of B.C. Fisheries;

- First Nations have access to tenures through Interim Measures, and working with their marine biologists have the ability to move on opportunities;

- Community groups and organizations through the Ministry of Community, Aboriginal and Women's Services (formerly the Ministry of Community Development, Cooperatives and Volunteers) may be able to secure support for

business planning activities;

- Federal government resources can be explored to assist in planning including the Industrial Research Assistance Program (IRAP) and Community Futures; and
- Strategic alliances between community groups, First Nations and government may be able to harness numerous resources allowing a quicker development of the industry.

Finally, John indicated that the workshop participants had asked the provincial government to consider:

1. Developing a marine plant incubator or "kelp condominium" to assist individuals further understand and explore the opportunities of marine plant aquaculture;
2. Developing a website which identified marine plant resources;
3. Developing a clear and streamlined regulatory approval process.
4. Providing assistance in identifying specific high demand markets and plants which can produce the products.

Al Martin thanked all that attended for their participation in the workshop and summarized the messages that BC Fisheries would take away from the day's discussions. He noted that if a marine plant aquaculture industry is to develop on a greater scale in BC, then initiative for this must come from the ground-up. Al added that marine plant aquaculture holds great promise as an activity that would compliment the Shellfish Development Initiative.

Al emphasized that the Provincial Government's role in the development of a sustainable marine plant aquaculture industry is to provide technical support and a clear regulatory framework that promotes and enables British Columbians to pursue opportunities in marine plant aquaculture.

Al Martin:
BC Fisheries

MORNING DISCUSSION GROUPS

Following the overviews on the biology and technology of marine plant aquaculture and the government's regulatory process, participants were invited to participate in group discussions on either of the two topics.

DISCUSSION GROUP A: The biology and technology of marine plant aquaculture

The biology and technology discussion group was facilitated by Barron Carswell, B.C. Fisheries, and was assisted by resource experts including: Louis Druehl, Canadian Kelp Resources Ltd., Ed Cayer, Ocean Produce International and Michael Coon from the Land Use Coordination Office.

The participants were asked to consider three questions:

- From a biological/technical perspective what are the challenges participants are most concerned about?
- What can be done to address these challenges?
- What information is currently available to those who wish to learn more?

Need to identify productive sites which are accessible

Participants agreed that one of the primary challenges from a biological/technical perspective in moving ahead with marine plant aquaculture is securing a productive site. A productive site was identified as a location where the circulation patterns of water movement maximize nutrient supply.

It was noted that it may also be necessary to balance the benefits of selecting an ideal location (i.e. a site, which maximizes grow-out rates) with site logistics.

For instance, the ideal location for growing the large strong blades of the *Macrocystis* is in wave exposed areas. However, these areas also create hazards for the grower in terms of accessing the products and ensuring that there is sufficient anchorage on the lines to avoid breakage and drifting.

Growers need to develop adaptive technologies

The participants indicated that marine plant growers need to constantly adapt and be creative. For instance, since marine plants can be heavy and difficult to pull out of the water, operational improvements such as snap-lines can make a significant difference in the effectiveness of an operation.

Participants also cited the difficulty faced in generating quality products during the peak period of demand. For instance, the demand for *Macrocystis* is the greatest during the herring-spawn-on-kelp season; however the quality of *Macrocystis* is not at its peak.

Here again, participants cited the need to develop adaptive technologies to overcome these obstacles. One of the participants indicated that one way to overcome the challenge of low quality product during a high demand period is to lower the *Macrocystis* long lines to deep water so that they can absorb the nutrients and then pull-up the lines to the sunlight so that the plants can absorb the sunlight.

Land based marine aquaculture generated interest

Inspired by the land-based marine plant aquaculture opportunities discussed by Ed Cayer of Ocean Produce International, participants briefly discussed the merits of a similar type of land based aquaculture for the west coast.

Many participants thought that land-based aquaculture may be worthwhile exploring although salt water wells may not be possible due to the geology of the coast. Land-based culture would allow the grower to effectively control the temperature of the water to optimise growing conditions. Participants also noted that if alternative energy sources such as wind, solar were used, the costs of the greenhouse approach could be reduced.

To assist in developing the industry a kelp condominium was proposed

Participants identified a number of resources, which would help them in further identifying the merits of pursuing marine plant aquaculture.

One of the ideas was called a "kelp condominium". The concept would see a common facility established whereby marine plants could be grown on a small scale by residents, so that they could learn and understand more about what would be required to move into production levels. The facility would be helpful in researching opportunities, as well as allowing for individuals to be taught and mentored.

Participants urged government to provide individuals with access to experts

Participants also had other suggestions to assist those who wished to know more about the industry. These included:

- Ensuring that government representatives are available to assist those who wish to acquire additional information; and
- Promoting "strategic alliances" such as ensuring that other opportunities are created to allow consultants, seed suppliers and industry to get together to discuss opportunities and challenges.

DISCUSSION GROUP B: The Regulatory Approval Process

The regulatory approval process discussion group was facilitated by Al Martin, B.C. Fisheries, and was assisted by resource experts including: Scott Pilcher, B.C. Fisheries, Jim Russell BCAL, and Michael Coon from the Land Use Coordination Office.

The participants were asked to consider three questions:

- What are the major challenges from a regulatory perspective, which will impede new farms?
- What can be done to address these regulatory challenges?
- What other initiatives should government be considering?

Concern that a new regulatory process would take too long to implement

Participants in this discussion group expressed concern that a new regulatory process, which was separate and distinct from the shellfish development initiative would result in delaying any marine plant initiatives. That is, if a new regulatory process were to be introduced, tenures would not be issued until there was consensus among government and the community on the process.

Need to ensure that there is community support for marine plant aquaculture

Participants noted that in developing new businesses, community support is required. The support is dependent on being able to demonstrate that the marine environment is protected and will remain unaltered by marine plant aquaculture. Therefore, it was suggested that there was a need for up front planning on marine plant aquaculture to deal with questions that may arise concerning environmental, community and First Nations impacts.

Some of the participants suggested that the province should be involved in providing opportunities for pilot projects. These projects would provide information on the biological, environmental and economic feasibility of marine plant aquaculture.

Other participants indicated that residents in the area have already identified their support for shellfish farming and that marine plant aquaculture represents a very similar industry. Any issues related to environmental concerns including codes of practice should be addressed in the licensing conditions.

Participants suggested a number of possible provincial government initiatives.

Participants identified a number of initiatives which could assist interested individuals considering entering into the marine plant aquaculture business. These suggestions relate not only to regulatory issues but also include suggestions concerning biological and technical support. The regulatory suggestions included:

- Improving provincial/federal government coordination on regulatory issues.
- Ensuring that there is certainty regarding rules and regulations and that tenures are provided with security, which will encourage investment.

The biological/technical suggestions included that the provincial government:

- Provide ready access to information sources.
- Conduct risk assessments based on current knowledge of markets for potential species so those individuals interested in establishing businesses have a reasonable chance of success.
- Invest in research and development to ensure that the marine plant industry can maximize high-end opportunities in the pharmaceutical and nutraceutical markets.

AFTERNOON DISCUSSION GROUPS

Following the presentations by Ed Cayer on marketing and Bill Heath from B.C. Fisheries on business planning, participants were invited to participate in Group Discussions on either of the two topics.

Discussion Group C: Marketing

The marketing discussion group was facilitated by Al Martin of B.C. Fisheries and was assisted by the contributions of resource experts including Louis Druehl, Canadian Kelp Resources Ltd., Ed Cayer, Ocean Produce International and Michael Coon from the Land Use Coordination Office.

The participants were asked to consider three questions including:

- From the information delivered today, how challenging is the marketing aspect?
- What needs to be done to further develop the markets?
- How can we tap into existing markets?

Discussion Group D: Business Planning

The business planning discussion group was facilitated by Bill Heath, B.C. Fisheries, and was assisted by Carolyn Hole from the Ministry of Community Development Co-operatives and Volunteers.

The participants were asked to consider three questions:

- From a biological/technical perspective what are the challenges participants are most concerned about?
- What can be done to address these challenges?
- What information is currently available to those who wish to learn more?

Since the responses of participants overlapped the results of the two discussion groups are integrated into one section described below.

There is a need to identify products which are in demand before focussing on marketing

Participants noted that the west coast provides ideal conditions for marine plant growth. In addition, many community members have the skills and understanding of the marine environment to feel comfortable in growing marine plants.

It was agreed that the biggest challenge and the key to a successful business is to be able to identify and grow products, which have markets. The critical success factor, which is missing, is the understanding of the market demand for marine plant products. Once products with demand are identified, it will be possible to begin exploring marketing strategies.

As noted below, the participants then continued by discussing the series of challenges and steps to begin a business.

Need to identify a range of markets

Once the demand for specific marine products is identified, the participants agreed that the next step is to explore the range of uses for the product. This would involve identifying all the possible applications for the marine plant product including food, vitamin supplements, nutraceuticals, cosmetics and pharmaceuticals.

The third step is to identify the best methods to grow the marine plant product. Issues need to be addressed such as whether to pursue a foreshore area or a land based operation.

Participants also acknowledged the need for a plan on how they would grow-out the product (Development Plan).

Need for government assistance in determining grow-out rates

Individuals expressed concern regarding the difficulty of estimating the production levels given the lack of marine plant farms on the west coast. It was therefore recommended that the province conduct pilot studies which would assist interested entrepreneurs better understand grow out rates of different species. This suggestion also corresponds to the recommendations arising from Group A's suggestion regarding the "kelp–condominium."

A soon to be published government report may assist individuals identify costs ands revenues

Participants also agreed in the value of preparing a business plan. Individuals cited the challenges of preparing a business plan when there are so few examples of marine plant businesses.

Representatives from B.C. Fisheries indicated that they are hoping to prepare a document, which will assist. The "Estimated Costs ands Returns" document will be available later this summer and estimate costs and revenues of a kelp farm.

In addition to the financial issues, the participants suggested that a business plan should:

- Identify how the business will be structured (i.e. company or co-operative);
- Identify how the products will be processed;
- Include a strategy to ensure that the product has the highest quality;
- Identify how marketing and biological/technical constraints will be mitigated; and
- Describe how the business will achieve and maintain a competitive approach.

There is a need for educational facilities to offer training in marine plant aquaculture

Participants identified that one way to overcome the challenge of preparing the development and business plans was to provide assistance to individuals. Specifically, it was noted that many educational institutions such as Malaspina College, North Island College, Alberni-Clayoquot Sound Skills Centre, and the Shellfish Growers Association sponsor courses on shellfish business planning. It was suggested that these organizations consider expanding their training programs to include marine plants.

Opportunities do exist for organizations and individuals to obtain research funding

Individuals also indicated that consultants can play a role in assisting prepare their development or business plans. The participants acknowledged that the Ministry of Community Development, Co-operatives and Volunteers could assist co-operatives, local governments and First Nations. Individuals who were seeking assistance were encouraged to hear that opportunities might be available through the Ministry of Small Business Tourism and Culture.

Participants embraced the concept of forming strategic partnerships

Participants noted that the marine plant grower needed to have a variety of skills. That is, the group discussions concluded that the successful marine plant grower had to be a producer, a product developer and a marketer. In most cases, this would be impractical to expect from one individual.

Participants therefore embraced Ed Cayer's phrase regarding the importance of creating "strategic partnerships". The term refers to the need for a group of individuals to work together to ensure success.

The participants did not identify possible strategic partnerships in their discussion. However, following the meeting one individual noted that strategic partnerships were critical and that First Nations could for instance bring access to tenures, others have access to capital and markets and the province could provide some of the technical advice.

Appendix A: Workshop Agenda

WORKSHOP ON MARINE PLANT AQUACULTURE: CHALLENGES AND OPPORTUNITIES

Sponsored by the Ministry of Agriculture, Food and Fisheries

Friday May 18th from 9:30 a.m. – 4:00 p.m.

Long Beach Golf Course

9:30-9:35 **Opening Prayer**
Tla-o-qui-aht First Nation

9:35-10:00 **Opening Comments**
Bill Valentine: Deputy Minister of Fisheries
Neslon Keitlah: Nuu Chah Nulth

10:00-10:15 **The History of the Marine Plant Industry in B.C.**
Michael Coon: Director Land Use Coordination Office
Why hasn't the industry flourished?
What were the mistakes from the past?
How do we learn from these mistakes?

10:15-10:25 **Opportunities and Challenges of Marine Plant Culture**
Satara Malloch Marine Plant Specialist – B.C. Fisheries

10:25-11:oo **Case Studies of Successful Marine Plant Aquaculture Business and Other Opportunities for Successful Ventures**
Louis Druehl: President of Canadian Kelp Resources Ltd. Bamfield
Ed Cayer: Vice President Ocean Produce International, Shelburne, Nova Scotia

Introduction to Morning Working Groups

11:10-11:10 **Presentation: How Do You Identify Aquaculture Sites?**
Barron Carswell: Shellfish Industry Development Officer - B.C. Fisheries

1. How do you go about identifying a high potential site?
2. What tools are available once you have identified your species?

11:10-11:25 **Presentation: The Regulatory Approval Process: What is it? How Should it Evolve?**

Al Martin: BC Fisheries

Jim Russell: BC Assets and Lands

1. Description of current approval process
2. Discussion of business plan and development plan
3. Introduce possible regulatory process – piggyback with existing community process for shellfish whereby areas and capacity are already identified or develop separate tenuring process for marine plants.

11:25-11:40 Break

11:40-12:15 Working Groups: Each participant will attend either Group A or Group B

Group A **Group Discussion on the Biology and Technology of Marine Plant Aquaculture**

Facilitator: Barron Carswell

Resource People: Louis Druehl/Michael Coon/Ed Cayer

1. From a biological/technical perspective what are the challenges participants are most concerned about?
2. What can be done to address these challenges?
3. What information is currently available to those who wish to learn more?

Group B **Group Discussion on the Government's Regulatory Environment**

Facilitator: Al Martin

Resource People: Scott Pilcher, Jim Russell, Bill Mottershead, Michael Coon

1. What are the major challenges from a regulatory perspective that will impede new farms?
2. What can be done to address these regulatory challenges?
3. What other initiatives should government be considering?

12:15-12:45 Catered Lunch

12:45 –12:55 **Presentation: Programs Available to Assist the Aquaculture Industry**

Carolyn Hole : Ministry of Community Development, Co-operatives and Volunteers

Introduction to Afternoon Working Groups

1:2:55-1:20 **Presentation: If You Grow It - How Can You Sell it?**

Ed Cayer– Ocean Produce International

Discussion on the lessons learned regarding quality control, marketing and processing. What markets exist? What markets can be developed?

What needs to be done to develop these markets?

Comments by Louis Druehl

1:20-1:35 **Presentation: The Business Plan**

Bill Heath: Shellfish Production Specialist Ministry of Agriculture Food and Fisheries.

Why prepare a business plan? What a business plan needs to consider. What is the best way of preparing one?

1:30-2:15 Working Groups: Each participant will attend either Group C or Group D

Group C **Group Discussion on Marketing**

Facilitators: Al Martin, Satara Malloch

Resource People: Ed Cayer, Louis Druehl

1. From the information delivered today, how challenging is the marketing aspect?
2. What needs to be done to further develop the markets?
3. How can we tap into existing markets?

Group D **Group Discussion on Business Planning**

Facilitator: Bill Heath

Resource People: Jim Russell, Carolyn Hole

1. Identify the challenges you face in preparing a Business Plan?
2. What steps can First Nations, government, industry and training organizations take to minimize these challenges?
3. What are the priorities or critical next steps?

2:15-2:30 Break

2:30- 3:00 **Report back by the facilitators.**

Group A: Barron Carswell: Addressing the Biological /Technological and Training Issues

Group B: Al Martin: Addressing the Regulatory Challenges

Group C: Ed Cayer: Addressing the Marketing Challenges

Group D: Bill Heath: Addressing the Challenges of Business Planning

3:00-3:30 **Group Discussion: Next Steps: Starting a Marine Plant Aquaculture Business-What Needs to Happen Next?**

Facilitators: Barron Carswell and Al Martin

1. What is the best way for someone to begin in this industry?
2. Are there opportunities from what you heard today?
3. What would make you more comfortable about getting involved?

- ← Steps by the Provincial or Federal Government
- ← Steps by industry
- ← Steps by the community or community organizations
- ← Steps by individuals

3:30- 3:40 **Facilitators Report on Next Steps**

3:40-4:00 **Closing Comments**

Appendix B: List of Attendees

NAME	ASSOCIATION	ADDRESS
Adrian Redford	SOKOA	PO Box 54 Lund, BC, V0N 2G0
Al Martin	BC Fisheries	Victoria
Allan Peacock		General Delivery, Tofino BC V0R 2Z0
Andrea Arnett		Box 447 Tofino BC, V0R 2Z0
Andrew Jackson		Box 18 Tofino BC V0R 2Z0
Andrew Morgan	Pacific Region Aquaculture Coordinator	Vancouver
Ann Marshall		Box 74 Ucluelet, BC V0R 3A0
Barron Carswell	BC Fisheries	780 Blanshard
Ben Willihms	Tlaoquiaht	Box 18 Tofino, BC
Bill Heath	BC Fisheries	Courtenay, BC
Bill Morrison	North Island College	Box 278 Tofino, BC, V0R 2Z0
Brian Merwin	Community Futures Development Corporation	4757 Tebo Avenue, Port Alberni, BC, V9Y 8A9
Cam MacPherson		Box 584 Tofino, BC, V0R 2Z0
Carolyn Hole	Ministry of Community Development, Cooperatives and Volunteers	Victoria
Caron Olive	EcoTrust Canada	PO Box 166 Ucluelet, BC
Charlie Cootes	Uchucklesaht	General Delivery, Kildonan, BC, V0R 2B0
Chris Neufeld	BC Fisheries	Courtenay, BC
Cindy Chang	Fisheries Renewal BC	#303 960 Quayside Drive New Westminster, BC
Claire Townsend	BC Fisheries	Victoria, BC
Craig Hall		#4 2180 Renfrew Rd. Shawnigan Lake, BC
Cynthia Carlos	Nuu Chah Nulth Economic Development Corporation	P.O. Box 1384, Port Alberni, BC, V9Y 7M2
Darryn Brown		1332 Chesterman Bc Rd, Tofino, BC
Dave Arrmitage		PO Box 291 Uclulet, BC
David Saxby	Biozyme	4160 Marine Drive, Vancouver, BC V7V 1N6
Don Pepper		#6 3555 Westminster Highway, Richmond, BC
Ed Cayer	Ocean Produce International	Shelburne, N.S.
Geoff Lindsay		Box 74 Bamfield, BC V0R 1B0
George Walkem		General Delivery, Tofino, BC, V0R 2Z0
Glen Johnson	Oweekeno Nation	c/o Bag 3500, Port Hardy, BC
Guy Louie	Ahousaht	PO Box 56 Ahousaht, BC, V0R 7A0
Heinz Dyck	Ministry of Aboriginal Affairs	908 Pandora Ave, Victoria, BC
Helen Kerr	Office of Commissioner for Aquaculture Development	460-555 W. Hastings, Vancouver, BC
Ian Sutherland	IEC	1131 Roy Rd.
Jennifer Walkus	Oweekeno Nation	c/o Bag 3500 Port Hardy, BC
Jim Lane	Nuu-chah-nulth Tribal Council	PO Box 1358 Port Alberni, BC
Jim Russell	BC Assets and Lands	Nanaimo, BC
Jim Turner		1150 ?? Tofino, BC
Joe Campbell		PO Box 116 Ahousaht, BC V0R 7A0
Joe Curley		PO Box 18,Tofino, BC
Joe Truscott	BC Fisheries	Victoria, BC

John Kafka	Cornerstone Planning Group	Sidney, BC
Josie Osborne	Nuu-chah-nulth Tribal Council	PO Box 369 Ucluelet BC, V0R 3A0
Kechura Palm		PO Box 799 Tofino, BC
Kevin Conley	Fisheries and Oceans Canada	PO Box 970 Ucluelet BC, V0R 3A0
Lain O'Gorman		PO Box 799 Tofino, BC
Lawrence F.		PO Box 123 Uclulet BC
Lena and Ken Collins	Oweekeno	c/o Bag 3500, Port Hardy BC
Louis Druehl	Canadian Kelp Resources Ltd.	Bamfield, BC
Marion Campbell	Ahousaht	General Delivery, Ahousaht, BC V0R 1A0
Michael Amrhein	Clayoquot Sound Central Region Board	Box 376 Tofino, BC V0R 2Z0
Michael Coon	Land Use Coordination Office	Victoria, BC
Natasha Greening		1840 Knight Rd. Comox, BC, V9M 4A2
Nene VanVolson	Hupacasath	PO Box 211 Port Alberni, BC, V9Y 7M7
Pat O'Connell	Advance Contract Services	Site 304 C30 Port Alberni, BC, V9Y 7C7
Paul Lucas	Hesquiaht	Box 2000 Tofino, Hot Springs Cove, BC
Percy Redford	Spawn on Kelp Association	PO Box 54 Lund, BC V0N 2G0
Peter T.	Hupacasath	PO 211 Port Alberni, BC, V9Y 7M7
Rae Hopkins	Canadian Kelp Resources Ltd.	Bamfield, BC
Robert Mundy		Box 1120 Ucluelet BC
Roberta Stevenson	Nuu-chah-nulth Tribal Council Shellfish Coordinator	PO Box 32 Heriot Bay, BC V0P 1H0
Rufus Charleson	Hesquiaht	PO Box 526 Tofino, BC, V0R 2Z0
Sam Mickey	Hesquiaht	General Delivery, Tofino, BC
Satara Malloch	BC Fisheries	Victoria, BC
Scott MacDonald	Pacific Sun Ecologic Ltd	Box 718 Uclulet, BC, V0R 3A0
Shane Rothwell		1633 Ralph St. North Vancouver, BC
Sue Charleson	Hesquiaht	PO Box 103, Tofino BC V0R 2Z0
Terry Simonson	Ministry of Aboriginal Affairs	Min. A.A. 908 Pandora St. Victoria, BC
Viola Clark	Ahousaht	Box 116 Ahousaht, BC, V0R 7A0
Yanny Barney	Nuu-chah-nulth Tribal Council Fisheries Summer Student	RR3, Site 349, C-26, Port Alberni, BC